AMENDMENTS TO THE SPECIFICATION:

Please amend paragraph [0008] on page 3 as follows:

[0008] Band bending can be achieved by suitably polarizing the semiconductor with respect to the liquid with a power supply. The back contact to the semiconductor electrode is Ohmic in character while the semiconductor-liquid interface acts as a ~~Scottky~~ Schottky barrier. Therefore, most of the applied voltage is dropped at the semiconductor-liquid interface creating a space charge (depletion or accumulation) layer in the semiconductor. The formation of depletion or accumulation layer depends on the bias and the type of semiconductor. The nature of band bending can be changed from depletion to accumulation by changing the sign of the applied potential with respect to flat band potential of the semiconductor-liquid interface.

Please amend paragraph [0024] beginning on page 6 as follows:

[0024] The charged biomolecules move in response to the electric field provided by this low voltage. If the focused beam is scanned to an adjacent spot on the semiconductor, the molecules move along with the light beam because they are attracted to this newly irradiated and spatially distinct spot by the above described change in the electrokinetic potential. If the buffer solution also contains a molecule sieving agent, this movement of molecules that results from the photoinduced potential changes allows different molecules to be separated by size, a process completely analogous to that which occurs in gel electrophoresis. By properly adjusting the scan speed, different molecules can be separated with extreme precision. This technique allows for separation in multiple directions, utilizing any or all of the properties of size, mass, and ionization-potential of the biomolecules that are intended for high-resolution separation on a microchip. This sieving action ~~cam~~ can be accomplished by artificially patterning the surface to provide a resistance to the movement of the charged particles.

Please amend paragraph [0035] at page 10 as follows:

[0035] As shown in Fig. 4, applying the voltage potential across the substrate/film interface 16 bends the conduction and valence bands 36, 38 in the substrate 12. Bending the conduction band 36 below the Fermi level ~~40~~ 41 for the substrate 12 creates the depletion region 18 in the substrate 12 at the substrate/film interface 16. The depletion region 18 can provide a source of electrons or holes to create a photopotential in the film 14, as discussed below.

Please amend paragraph [0039] at page 11 as follows:

[0039] The photon energy source 30 raises the energy level of the substrate 12 at the substrate/film interface 16 above the Fermi level 41 to create electron-hole pairs in the depletion region 18 which are separated by the voltage potential. The separated electrons and holes have opposite charges which cause the electrons to move in a direction opposite of the holes. By proper choice of the substrate 12 (for example, a p-type semiconductor substrate material or n-type semiconductor) and electrode 26 (cathodic or anodic), either electrons or holes can be brought to the substrate/film interface 16 to create a photopotential in the film 14. For example, if a p-type semiconductor substrate material is used, the electrons move toward the substrate/film interface 16.